Public Comments and Responses

On March 18, 2004, the Puget Sound Treaty Tribes (PSTT) and the Washington Department of Fish and Wildlife (WDFW) provided a jointly developed resource management plan to National Marine Fisheries Service (NMFS), Northwest Regional Office. The resource management plan, titled the "Puget Sound Comprehensive Chinook Management Plan: Harvest Management Component," dated March 1, 2004 (hereafter referred to as the RMP), provides the framework through which the tribal and state jurisdictions would jointly manage all salmon and gillnet steelhead fisheries that may impact listed chinook salmon within the greater Puget Sound area. The co-managers proposed that the RMP remain in effect for six years, from May 1, 2004 through April 30, 2010.

NMFS published a notice in the *Federal Register* announcing the availability of its Proposed Evaluation and Pending Determination (PEPD) on the RMP for public review and comment on April 15, 2004 (69 FR 19975). The comment period closed on May 17, 2004. Three commenters provided comments to NMFS on the PEPD during this public comment period. NMFS has reviewed the comments received and discussed the substantive issues with the co-managers. Several of the comments were addressed and reflected in NMFS' final Evaluation and Recommended Determination (ERD). The co-managers made no modifications to the RMP based on public comments received on NMFS' PEPD.

Comments received from the public in response to the NMFS announcement of the PEPD for review are summarized as follows:

On Tuesday, May11, 2004, NMFS received e-mail comments from Mr. Robert Hayman of the Skagit River System Cooperative. The comments were submitted in the form of electronic versions of three documents: "NMFSFinalE&DComments504.doc"; "BYExplRateCalcs2004 PopStatFix 404.xls"; and "SkgtSFCkProjectn4E&D404.xls". Under the implementation of the RMP, the projected range of exploitation rates for the Skagit summer/fall chinook salmon management unit was estimated to be 48 to 56 percent (Table 3 in the PEPD). The PEPD qualified this projection by stating that this range of exploitation rates probably overestimates the actual rates under the RMP. Mr. Hayman agreed with this assessment and requested that his three documents be included as part of the public record on the PEPD "so that they are available if further elaboration is needed about the Evaluation and Determination's assessment of Skagit summer/fall chinook." No change to the PEPD was necessary.

On Tuesday, May11, 2004, NMFS received comments from Mr. Sam Wright. Mr. Wright commented that the Final Environmental Impact Statement (FEIS) should be completed prior to soliciting public review comments on the PEPD. Mr. Wright's comments were primarily directed at the Draft Environmental Impact Statement (DEIS). The comments addressed the alternatives of the DEIS and proposed an additional alternative, which he referred to as Alternative 1A. He asked that these comments on the DEIS be incorporated by reference. Mr. Wright provided no other direct comments on the PEPD. The

discussion on the various alternatives is not directly applicable to the PEPD. Mr. Wright's comments pertaining to the DEIS will be addressed in the FEIS process.

On Monday, May 17, 2004, through e-mail, NMFS received comments on the PEPD from the Washington Trout (WT). The commenter recommends that NMFS substantively revise the PEPD before a final determination is developed. The structure of the WT's comments was presented in nine identified sections. These sections were: Introduction; Minimum Fishery Regime; Management Objectives and Indicators; Recovery Exploitation Rates; Upper Management Thresholds; Low Abundance Thresholds; Critical Exploitation Rate Ceiling; Critical Exploitation Rate Ceiling; and Other Issues of Concern. In responding to the WT's comments, NMFS will use a similar structure.

Response to Comments

"Introduction" Comments:

Comment 1 – In the introduction section, the commenter requested that the PEPD: (1) provide a detailed explanation of key terms and concepts employed in the RMP. The commenter stated that the PEPD employs important legalistic and technical-biological terms and concepts without ever attempting to explain them; (2) provide a detailed and critical description and assessment of the key assumptions made by the RMP; (3) clearly describe and characterize the several kinds of risk that the harvest regime may pose to populations of the listed Evolutionarily Significant Unit (ESU) and to the ESU as a whole; (4) characterize relevant and critical uncertainties with methods used in the PEPD; (5) evaluate whether the proposed fishery regime(s) is(are) described in sufficient detail to permit a clear assessment of the extent to which the regime is risk-averse to potential impacts on populations of the listed ESU; (6) clearly describe and explain the extent to which the proposed harvest regime is risk-averse to harmful impacts on individual populations of the listed ESU and the ESU as a whole; and, (7) require the RMP to employ clearly articulated impact-threshold targets to be attained (or to be avoided), with clearly articulated management actions that will be taken in response when critical thresholds are not attained (or not avoided), and clear time frames for taking corrective actions and for achieving the desired targets of the corrective actions.

Response: NMFS found these comments too general in nature and lacking necessary specifics to properly respond. NMFS assumes, given that that these comments were in the "introduction" section, that many of these comments will be addressed by responding to the more specific comments that followed in other sections. For a general response, as required in section (b)(6)(iii) of the Endangered Species Act of 1973 (ESA) section 4(d) rule for listed Puget Sound chinook salmon (referred hereafter as the ESA 4(d) Rule), the RMP, in NMFS' opinion, must adequately address eleven criteria under section (b)(4)(i) in Limit 4. The criteria under Limit 4 section (b)(4)(i) are summarized in Table 1, page 3 of the PEPD. Compliance with these criteria does not necessarily require the most conservative response. The RMP proposes implementation of restrictions to the fishery-related mortality to each Puget Sound chinook salmon population or management unit. The RMP's restrictions to the cumulative fishery-related mortality are expressed as: (1) a

rebuilding exploitation rate; (2) an upper management threshold; (3) a low abundance threshold; and (4) a critical exploitation rate ceiling (Table 2 of the PEPD). For select management units, Appendix A: Management Unit Status Profiles of the RMP describes how these thresholds or exploitation rate limits were derived. NMFS did not necessarily evaluate the RMP's definition of terms or the assumptions the co-managers used in developing the RMP's mortality limits. In the PEPD, NMFS compared the proposed RMP's mortality limits, regardless of their basis, to the NMFS-derived critical and viable threshold standards. NMFS used the best data available to estimate these critical and viable thresholds for each population. The PEPD also evaluated the effects of implementing the RMP's mortality limits. The co-managers, in cooperation with NMFS, modeled the anticipated impacts of implementing the proposed RMP's mortality limits. The modeling used risk-averse assumptions in determining potential impacts and the resultant escapement. The modeling assumed the fishing regime under the RMP would closely resemble that planned for 2003, and modeled those fishing regulations for the southern United States (SUS). The modeling also assumed a range of intercepting fisheries to include the highest Canadian harvest allowed under the 1999 Pacific Salmon Treaty (PST) agreement, as well as those in 2003. The modeled range of Puget Sound chinook salmon abundance was bounded by the 2003 forecast abundance and a 30 percent reduction from that level for all populations. The anticipated results of implementing the RMP were compared against the criteria outlined under Limit 6 of the ESA 4(d) Rule. NMFS' approach in its evaluation is conservative, and takes into consideration the uncertainty of the data. Through its evaluation of the RMP, NMFS Northwest Region's Sustainable Fisheries Division concluded that the RMP adequately addressed all the criteria outlined in the ESA 4(d) Rule, including implementing and enforcing the RMP, and would not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook Salmon ESU. Information provided in the PEPD, along with the information included and available by reference, provides the reviewer the information necessary to evaluate NMFS' risk criteria used to reach this conclusion.

Comment 2: The commenter expressed concern regarding the PEPD's conclusion that the RMP "would not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook Salmon ESU." The commenter believes that this finding reflects an opaque standard, open to any number of subjective interpretations, including the most minimal.

Response: This language in question in the PEPD is taken directly from section (b)(6)(i) of the ESA 4(d) Rule. The ESA 4(d) Rule states that "...the [take] prohibitions of paragraph (a) of this section relating to threatened species of salmonids ..... do not apply to actions undertaken in compliance with a resource management plan ..... provided that: (i) The Secretary has determined ..... that implementing and enforcing the joint tribal/state plan will not appreciably reduce the likelihood of survival and recovery of affected threatened ESUs" (50 C.F.R. 223.203(b)(6)). Some of the criteria outlined in the ESA 4(d) Rule require NMFS to evaluate the RMP's impacts on individual populations. One of the criteria for Limit 6 of the ESA 4(d) Rule is that harvest actions that impact populations at or above their viable thresholds must maintain the population or management unit at or above that level. Overall, along with other on-going habitat and

hatchery programs, the results of harvest actions since the ESA listing of the Puget Sound Chinook Salmon ESU appear to be maintaining these populations above the viable threshold levels as required by the ESA 4(d) Rule. Another criterion for Limit 6 of the ESA 4(d) Rule is that fishing-related mortality on populations above critical levels, but not at viable levels (as demonstrated with a high degree of confidence), must not appreciably slow achievement to viable function. The criterion for populations at or below their critical thresholds is that fishing-related mortality on the population must not appreciably increase genetic and demographic risks facing the population, and does not preclude achievement of viable functions, unless the RMP demonstrates the likelihood of survival and recovery of the entire ESU in the wild would not be appreciably reduced by greater risks to an individual population. Only one population in the ESU, the North Fork Nooksack River population, is considered to be below its critical threshold (see Table 9 of the PEPD). For the North Fork Nooksack River population, NMFS concludes that the RMP does not appreciably increase genetic and demographic risks facing this population, as required by the ESA 4(d) Rule, for a population below their critical level. However, the ESU, not the individual populations within the ESU, is the listed entity under the ESA. Through its evaluation of the RMP, NMFS Northwest Region's Sustainable Fisheries Division concluded that the RMP would not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook Salmon ESU.

"Minimum Fishery Regime" Comments:

Comment 3: The commenter believes that the PEPD introduces factors that appear to be extra-biological mitigation for various and specific anticipated risks to the ESU imposed by the RMP, including what appears to be consideration of the need for a fair distribution of the burden of conservation. The commenter suggests that the relationship of the RMP to Canadian and Alaskan fisheries appears to be NMFS' most explicit attempt in the PEPD to distribute the conservation burden fairly.

Response: As required in section (b)(6)(iii) of the ESA 4(d) Rule, the RMP must adequately address eleven criteria under section (b)(4)(i) in Limit 4. How the conservation burden was distributed among the various sections is not one of the eleven criteria used to evaluate the RMP under the ESA 4(d) Rule. However, to provide the reviewer a better understanding of the RMP, the PEPD did present the co-managers' perspective on certain aspects of the RMP. From the co-managers' perspective, the Minimum Fishery Regime proposed in the RMP addresses conservation concerns "while still allowing a reasonable harvest of non-listed salmon" (page 17 of the RMP). The PEPD (page 5) incorrectly alludes that it is the co-managers' perspective that the RMP represents a fair distribution of the burden of conservation. Reference to the co-manager's perspective that the RMP represents a fair distribution of the burden of conservation was removed from the ERD. However, NMFS did not evaluate the co-managers' perspective of the minimum fisheries regime. NMFS evaluated the effects of the proposed action, in this case the implementation of Puget Sound fisheries under the abundance and non-SUS fisheries anticipated in the next five years. In evaluating the effects of the action, Canadian impacts are considered in the baseline.

Comment 4: The commenter believes that the recognition of tribal treaty rights would mandate the acceptance of a base level of fisheries that must always be allowed, under any circumstance. It was of concern to the commenter that the RMP would propose that there was no conceivable circumstance potentially faced by the ESU that would warrant the complete restriction of fishery impacts on an individual management unit.

Response: Similar to recent years, it is likely that the vast majority of the SUS fishery harvest impacts on the Nooksack Management Unit populations under the RMP would occur in treaty Indian fisheries. Since 2001, the majority of the SUS harvest on the Nooksack Management Unit has occurred in tribal fisheries. In recognition of tribal management authority and the Federal government's trust responsibility to the tribes, NMFS is committed to considering their judgment and expertise regarding the conservation of trust resources. Consistent with this commitment and as a matter of policy, NMFS has sought, where there is appropriate tribal management, to work with tribal managers to provide limited tribal fishery opportunities, so long as the risk to the population remains within acceptable limits. NMFS evaluated the RMP based on what is likely to occur over the next five fishing seasons, May 1, 2005 to April 30, 2010, the remaining duration of the RMP. To approve the RMP under the ESA 4(d) Rule, NMFS must conclude that the RMP adequately address the criteria outlined in the ESA 4(d) Rule, including the criterion that implementing the RMP will not appreciably reduce the likelihood of survival and recovery of the Evolutionarily Significant Unit in the wild, over the entire period of time the proposed harvest management strategy affects the population. Compliance with these criteria does not necessarily require the most conservative response. In the PEPD, the anticipated results of implementing the RMP were compared against the criteria outlined under Limit 6 of the ESA 4(d) Rule. Through its evaluation of the RMP, NMFS Northwest Region's Sustainable Fisheries Division concluded that the RMP adequately addressed all the criteria outlined in the ESA 4(d) Rule, including implementation and that enforcing the RMP would not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook Salmon ESU. The "complete restriction of fishery impacts on an individual management unit" was not necessary to meet the criteria outlined under Limit 6 of the ESA 4(d) Rule. If impacts under the implementation of the RMP are greater than expected, NMFS can withdraw the ESA 4(d) Rule determination or ask the co-managers to adjust fisheries to reduce impacts.]

Comment 5: The commenter suggests that the minimum fisheries regime proposed in the RMP will not result in significant reductions in either the total exploitation impacts experienced by management units, or the SUS [southern United States] or pre-terminal SUS exploitation rates. The commenter believes that this inadequacy conflicts with the RMP's characterization of the minimum fisheries regime as "extraordinary fisheries conservation measures" designed to "minimize" impacts on management units from fisheries.

Response: NMFS did not evaluate the RMP's characterization of the minimum fisheries regime. The anticipated results of implementing the RMP, not the RMP's characterization of the minimum fisheries regime, were compared against the criteria

outlined under Limit 6 of the ESA 4(d) Rule. Compliance with these criteria does not necessarily require the most conservative response. The RMP proposes implementation of restrictions to the fishery-related mortality to each Puget Sound chinook salmon population or management unit. The RMP's limits to the cumulative fishery-related mortality are expressed as: (1) a rebuilding exploitation rate; (2) an upper management threshold; (3) a low abundance threshold; and (4) a critical exploitation rate ceiling (Table 2 of the PEPD). The co-managers, in cooperation with NMFS, modeled the anticipated impacts of implementing the RMP, which uses these four harvest mortality limits in combination to manage the fisheries. Table 3 of the PEPD provides the anticipated range of exploitation rates and anticipated escapements for Puget Sound chinook salmon under the implementation of the RMP. In addition, in the RMP, the co-managers also presented data that suggest that significant reductions in the exploitation rate in some systems have not resulted in substantially higher returns of natural-origin chinook salmon. Although, this has not been conclusively demonstrated for many populations, it is suggestive that habitat, not fishery-related mortality, may be the limiting factor on production in some systems.

Comment 6: The commenter states that the description of the various SUS exploitation rates is confusing. As an example, the commenter suggests that a comparison of Table 2 with Table 5 fails to clarify what, if any, the changes in fishery regimes would occur under the minimum fishery regime.

Response: For most management units, the RMP's critical exploitation rate ceiling imposes an upper limit on southern United States (SUS) exploitation rates when spawning escapement for a management unit is projected to fall below its low abundance threshold *or* if Canadian fisheries make it difficult or impossible to achieve the RMP's rebuilding exploitation rate. The co-managers define "impossible" if the northern fisheries by themselves impose an exploitation rate above the rebuilding exploitation rate or reduce abundance so that either the upper management threshold or the low abundance threshold could not be achieved even with zero SUS fishing. The co-managers define "difficult" if, in order to achieve a total exploitation rate less than the rebuilding exploitation rate, or escapement above the upper management threshold, SUS fisheries directed at abundant un-listed chinook and other species would have to be constrained (W. Beattie, NWIFC, e-mail to K. Schultz, NMFS, August 6, 2004). The RMP provides a general description of the fisheries that will represent the lowest level of fishing mortality on listed chinook salmon proposed by the co-managers. A general description of these minimal fisheries is outlined in Appendix C: Minimum Fisheries Regime of the RMP. In modeling the fisheries, instances where the RMP's critical exploitation rate ceiling was imposed on a management unit can be identified by reviewing the anticipated escapement or exploitation rates. If the anticipated escapement was below the RMP's low abundance threshold or if the exploitation rate was greater than the RMP's rebuilding exploitation rate, then the modeling exercise imposed the RMP's critical exploitation rate ceiling. Table 2 in the PEPD are the RMP's management objectives (rebuilding exploitation rate, upper management threshold, low abundance thresholds, and the critical exploitation rate ceiling), by management units and populations. Table 2 in the PEPD shows the change in the exploitation rate under the RMP's rebuilding exploitation rate and the exploitation

rate under the minimum fishery regime, the critical exploitation rate ceiling. Table 5 in the PEPD are the most likely total exploitation rates, southern United States (SUS) exploitation rates, and escapements within the modeled forecasts under the implementation of the RMP by Puget Sound chinook salmon management unit or population. To assist the reader, a column was added to Table 5 of the ERD and to the tables in Appendix A of the ERD that identify the management units in which the RMP's critical exploitation rate ceiling for that management unit was implemented during modeling.

Comment 7: The commenter stated that under the RMP's minimum fishery regime, additional conservation measures on the SUS fisheries may be considered by the co-managers "where analysis can demonstrate that additional conservation measures in fisheries would contribute substantially to recovery of a management unit…". The commenter suggests that the RMP and the PEPD make no attempt to define or identify what would constitute a "substantial" contribution to recovery.

Response: The co-managers propose that where analysis can demonstrate that additional conservation measures in fisheries would contribute substantially to recovery of a management unit, the co-managers may, at their discretion, and in concert with other specific habitat and enhancement actions, implement them (see page 34 of the RMP). The need to define or identify what would constitute a substantial contribution to recovery is not needed to evaluate the RMP under Limit 6 of the ESA 4(d) Rule. The co-managers, in cooperation with NMFS, have modeled the anticipated impacts of the implementation of the RMP. Appendix A of the PEPD contains the model run results. The analysis of the anticipated results of implementing the RMP, without the inclusion of these possible additional conservation measures in fisheries, was evaluated against the criteria under Limit 6 of the ESA 4(d) Rule. If the actual escapement outcome during the next five years is below that modeled, NMFS will meet with the co-managers to discuss possible additional management actions the co-managers may take. Additionally, NMFS may reconsider revoking the ESA 4(d) determination. However, the co-managers have instituted additional management measures under low abundance conditions in the past to decrease fishery impacts. The demonstrated willingness of the co-managers to constrain fisheries over the past 15 years, without certainty of substantial benefit to the ESU, gives NMFS some confidence in their future response to a population with a declining status.

Comment 8: Table 2 of the PEPD summarizes the relationship between the various management objectives and exploitation rates for each management unit. The commenter believes that Table 2 is confusing and potentially misleading. In Table 2, some of the RERs [rebuilding exploitation rates] are expressed as pre-terminal SUS and SUS rates, without clearly identifying that the rate does not include impacts from Canadian and Alaskan Fisheries.

Response: The categorization of the exploitation rates within the Table 2 of the PEPD is clearly identified as either total, southern United States (SUS), or pre-terminal southern United States (PT SUS). Additionally, Footnote 2 of Table 2 of the PEPD reads, in part, as follows: "The SUS fishery includes all fisheries south of the border with Canada that

may harvest listed Puget Sound chinook salmon. The SUS fishery includes both pre-terminal SUS and terminal SUS fisheries. The co-managers define a pre-terminal fishery as a "fishery that harvests significant numbers of fish from more than one region of origin" (page 65 of the RMP). The co-managers define a terminal fishery as a "fishery, usually operating in an area adjacent to or in the mouth of a river, which harvests primarily fish from the local region of origin, but may include more than one management unit" (page 65 of the RMP). The terminal SUS fisheries will vary by management unit and may occur in freshwater and marine areas." A similar description of the categorization of the exploitation rates can be found within the main body of the PEPD, on page 7.

Comment 9: The commenter suggested that the RMP's critical exploitation rate ceilings are "driven by policy considerations" and not by biological (i.e., conservation) considerations. The commenter believes that these "policy considerations" are not described in the RMP and that their legal basis is not explicitly described, explained, and/or justified.

Response: Although the RMP's critical exploitation rate ceilings were primarily based on policy concerns, biological and conservation considerations were also taken into account by the co-managers in developing the ceilings. All other harvest mortality limits in the RMP (rebuilding exploitation rates, upper management thresholds, and low abundance thresholds) were derived using biological consideration rather than policy-driven parameters. NMFS compared the proposed RMP's mortality limits, regardless of their basis, to the NMFS-derived standards. NMFS' evaluation focused on the effects of implementing the RMP's mortality limits. The co-managers, in cooperation with NMFS, modeled the anticipated impacts of implementing the RMP. A description of the co-managers' policy considerations used to develop the RMP's critical exploitation rate ceilings was not needed to evaluate the impacts of the RMP under Limit 6 of the ESA 4(d) Rule. In recognition of tribal management authority and the Federal government's trust responsibility to the tribes, NMFS is committed to considering their judgment and expertise regarding the conservation of trust resources. Consistent with this commitment and as a matter of policy, NMFS has sought, where there is appropriate tribal management, to work with tribal managers to provide limited tribal fishery opportunities, so long as the risk to the population remains within acceptable limits.

"Management Objectives and Indicators" Comments:

Comment 10: The commenter states that the RMP proposes to manage harvest on the basis of the status of individual populations. The commenter suggests that the substance of the proposed regime overstates the extent to which the RMP is supportive of recovery within five management units: Nooksack, Skagit Summer/Fall chinook, Skagit spring chinook, Stillaguamish, and Snohomish. The commenter believes that in none of these four [five] management units is the maximum ("recovery") exploitation rate based directly upon an estimate of the maximum allowable rate sustainable by the weakest component stock. The commenter believes that this reliance on management unit rates contradicts the claim by the RMP and the PEPD that the RMP proposes a harvest

management regime in which exploitation rates are restricted by the weakest component population.

Response: For most management units with multiple populations, the objectives in the RMP are based on the management for the weakest component (e.g. see Appendix A: Management Unit Status Profile of the RMP for the Snohomish Management Unit). In NMFS' evaluation of the RMP, the management unit's anticipated exploitation rate was applied to all populations within that management unit. When available, the anticipated exploitation rates on individual populations were compared to the corresponding population-specific NMFS-derived rebuilding exploitation rates. NMFS also derived a rebuilding exploitation rate for the Nooksack Management Unit, which contains two populations, because data was insufficient to develop a population-specific rebuilding exploitation rates. In this case, the anticipated exploitation rates for the Nooksack Management Unit were compared to the corresponding management unit-specific NMFS-derived rebuilding exploitation rate. Additionally, the anticipated population-specific escapements were compared to NMFS-derived critical and viable thresholds or to the generic guidance provided by the Viable Salmonid Populations document (VSP) (NMFS 2000b as cited in the PEPD). This approach evaluates the anticipated impacts of the RMP on weakest component population within each management unit. Results showed that the NMFS-derived rebuilding exploitation rates for the weakest population within a given management units were generally met and often below the NMFS-derived rebuilding exploitation rates. However, it also needs to be noted that although populations contribute fundamentally to the structure and diversity of the ESU, it is the ESU, not an individual population, which is the listed entity under the ESA.

"Recovery Exploitation Rates" Comments:

Comment 11: The commenter stated that the PEPD inappropriately references the draft RAP [risk assessment procedure] document of May 30, 2000. The commenter suggested that the method described in this citation was superceded by a method described in a document titled "Viable Risk Assessment Procedure". The commenter indicated that the latter document employed a harvest model more suitable for population viability modeling needed to assess harvest impacts on listed salmon populations.

Response: The method outlined in NMFS' document titled "A risk assessment procedure for evaluating harvest mortality of Pacific salmonids," dated May 30, 2000, is commonly referred to as the RAP model. Subsequent updates and improvements to the original RAP model resulted in the current model, known as the Viable Risk Assessment Procedure (VRAP) model. The VRAP model is what NMFS used to derive the rebuilding exploitation rates to evaluate the RMP. Unlike the RAP model, the VRAP model lacks complete documentation. However, the method used by NMFS to derive the rebuilding exploitation rates using the VRAP model are accurately described in NMFS' RAP document, as cited in the PEPD. The ERD was modified to make this clearer to the reader.

Comment 12: The commenter challenges the PEPD's assertion that harvest at or below NMFS-derived RERs "will not appreciably reduce the likelihood of rebuilding that population, assuming current environmental conditions based on specific risk criteria". The commenter suggests that no details are provided by NMFS regarding assumptions and calculations in support of this finding. Consequently, the commenter believes that it is impossible for the reviewer to know what "specific risk criteria" were employed, and to thereby judge the appropriateness of NMFS' finding.

Response: As stated on page 25 in the PEPD, NMFS-derived rebuilding exploitation rates were developed by using a simulation model to identify an exploitation rate for an individual population that meets specific criteria related to both survival and recovery, given the specified thresholds and estimated spawner/recruit parameters. The simulation used the population-specific threshold levels to identify an exploitation rate that met the following criteria: (a) the percentage of escapements less than the critical threshold value increase by less than five percentage points relative to no fishing, *and either* (b) the escapement at the end of the 25-year simulation exceeded the viable threshold at least 80 percent of the time *or* (c) the percentage of escapements less than the viable escapement threshold at the end of the 25-year simulation differed from the no-fishing baseline by less than 10 percentage points. The PEPD references Appendix C: Technical Methods - Derivation of Chinook Management Objectives and Fishery Impact Modeling Methods of the draft environmental impact statement (DEIS) on the proposed determination for a detailed explanation of rebuilding exploitation rate derivation. The PEPD also references NMFS' RAP modeling document, cited as NMFS 2000a, for additional information on how NMFS derived these rebuilding exploitation rates. Information provided in the PEPD, along with the information included and available by reference, provides the reviewer the information necessary to ability to evaluate NMFS' risk criteria.

"Upper Management Thresholds" Comments:

Comment 13: The commenter suggests that there is little real data available to the co-managers or NMFS on which to base firm, robust estimates of the current carrying capacity. The commenter stated that any estimate of a critical management threshold such as the MSH [maximum sustainable harvest] escapement level will inevitably be extremely uncertain. The commenter believes that it is extremely risky to employ such an uncertain point estimate as a management target, without at least acknowledging the uncertainty, which in practical terms should mean adjusting the target in a conservative direction relative to the risks associated with the uncertainty. The commenter believes that the PEPD fails to raise or discuss any critical considerations of these kinds about the approach taken by the RMP for estimating these escapement reference points and employing them in the proposed harvest management regime.

Response: In the PEPD, NMFS used the best estimate of the level of escapement that produces maximum sustainable yield (MSY) of the system. This level of escapement was referred to as the viable threshold in the evaluation. NMFS completed a comprehensive analysis to derive viable thresholds for a subset of Puget Sound chinook salmon populations (Table 8 of the PEPD). These viable thresholds are based on a spawner-

recruit analysis of recent years' catch and escapement data and include environmental variants. NMFS used these viable thresholds to determine the NMFS-derived rebuilding exploitation rates. The NMFS-derived rebuilding exploitation rates were set so that escapement would meet or exceed the viable threshold at least 80 percent of the time at the end of 25 years. By using at least 80 percent, one would on average obtain an escapement level greater than the MSY. During this fishery impact simulation modeling, NMFS assumed low marine survival rates for the salmon populations, which is conservative and risk adverse. Additionally, the RMP's rebuilding exploitation rates or escapement goals may be modified in response to the most current information about the productivity and status of populations, or in response to better information about management error. There is also uncertainty in the risk analysis simulation about actual exploitation rates beyond the duration of the RMP. The NMFS-derived rebuilding exploitation rates are based on simulations over a more conservative 25-year period, whereas the RMP's duration is for a much shorter duration. In other words, NMFS compared the RMP to NMFS' standards which were developed on simulations assuming fish would be harvested at a given rate over a 25 years period. NMFS' approach in evaluating the RMP is conservative and considers the uncertainty of the data and simulation outcomes.

Comment 14: The commenter suggests that the impact of past (over-) harvest on aggregate stocks (management units) is not taken into consideration in the estimation of stock-recruitment relationships.

Response: Development of data with which to manage Puget Sound chinook salmon has been an ongoing effort. Work towards a comprehensive approach to Puget Sound salmon harvest began in the late 1980s. A comprehensive chinook salmon management plan was implemented initially in 1997 by the co-managers. Revisions to the management framework have been made in subsequent years as new information became available. Subsequent Puget Sound chinook salmon escapements indicate that the reduced exploitation rates and other harvest management actions resulting from the implementation of these harvest plans have contributed to the stabilization and increase in Puget Sound chinook salmon escapement. The RMP has replaced the old escapement goals with rebuilding exploitation rates for several management units, and changed the escapement goals for others. However, the role of past harvest in current condition of the resource is not the primary consideration of the PEPD. The focus of the NMFS' evaluation is whether implementing and enforcing the proposed action will not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook Salmon ESU over a range of possible abundance and fishing conditions anticipated in the next five years. In the PEPD, NMFS evaluated the RMP's response to low abundance and concluded that implementing and enforcing the RMP would not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook Salmon ESU.

Comment 15: The commenter states that the RMP establishes upper management thresholds for populations or management units using methods such as "standard spawner-recruit calculations…, empirical observations of relative escapement levels and catches, or Monte Carlo simulations that buffer for error and variability…". The

commenter suggests that the RMP's harvest thresholds, derived through these simulations, are not appropriately risk-averse.

Response: The co-managers' method in establishing the RMP's upper management thresholds is risk-averse by acknowledging and attempting to account for known uncertainties. Many of the RMP's upper management thresholds were derived when sufficient data was available to use the classic spawner-recruit functions, augmented by incorporating environmental covariates. In addition, the spawner-recruit functions are fit by applying deviates from predicted calendar year escapements to observed escapements rather than the deviates of the estimated returns to predicted returns. Additionally, in the PEPD, NMFS compared the RMP's upper management thresholds to the NMFS-derived or VSP-derived viable thresholds and found that they were similarly conservative and risk-averse.

Comment 16: The commenter believes that the NMFS should not accept a 20 percent probability of *not* attaining a viable threshold within four to eight chinook generations.

Response: The NMFS-derived rebuilding exploitation rates were set to result in attainment of the viable threshold in at least 80 percent of the simulation runs by the end of 25 years (see response to Comment 13). NMFS' use of 25 years is conservative, as four to eight generations (number of generations in 25 years) is not a very long time to expect a population to respond to a change. Additionally, by using at least 80 percent as a condition, one would on average obtain an escapement level greater than this floor. NMFS' use of an 80 percent chance of achieving the viable threshold is reasonable. This approach is conservative considering uncertainty of the data and simulations.

Comment 17: The commenter believes that inability to detect a difference between harvest and no harvest regimes should not suffice as a justification for harvesting [declining] stocks.

Response: One of the criteria that must be adequately addressed to approve the RMP under the ESA 4(d) Rule is that NMFS must conclude that implementing the RMP will *not appreciably reduce* the likelihood of survival and recovery of Puget Sound Chinook Salmon ESU (emphasis added). In its evaluation, NMFS estimated the impacts on the populations within the Puget Sound Chinook Salmon ESU under a no-harvest regime and compares those results to the impacts associated with implementing the RMP. This comparison is necessary to assess whether or not implementation of the RMP will appreciably reduce the likelihood of survival and recovery of affected threatened ESU than if the action did not occur. NMFS-derived rebuilding exploitation rates were developed by using a simulation model to identify an exploitation rate for an individual population that meets specific criteria related to both survival and recovery, given the specified thresholds and estimated spawner/recruit parameters. The simulation used the population-specific threshold levels to identify an exploitation rate that met certain conditions (see response to Comment 12). One of those conditions is whether the percentage of escapements less than the critical threshold value increase by less than five percentage points relative to the baseline. The baseline assumes no salmon fisheries. This

approach recognizes that a population may improve or decline irrespective of the proposed action being evaluated. In situations where freshwater or estuarine survival is severely compromised by degraded habitat, even the total elimination of the harvest may not improve the population's productivity or status. If the risk assessment concludes that the percentage probability of escapements falling below the critical threshold will increase by less than five percentage points relative to the baseline, then it is reasonable to conclude that implementing the RMP will not appreciably reduce the likelihood of survival of Puget Sound Chinook Salmon ESU. The focus of NMFS' evaluation is on whether the difference is appreciable between the impacts associated with the implementation of the RMP and those that would still occur under the baseline.

Comment 18: The commenter believes that the PEPD relies upon questionable and controversial estimates of current habitat capacity to justify estimates of upper management thresholds.

Response: NMFS uses the best data available and continues to encourage the co-managers to improve and expand their data collection. Habitat capacity estimation is accomplished using several methods, and comparisons between results from the different methods are made to help evaluate the RMP. See response to Comment 19.

Comment 19: The commenter suggests that the PEPD relies on Ecosystem Diagnosis and Treatment (EDT) modeling estimates of spawner-recruit functions to argue that "further harvest constraint will not, by itself, effect an increase above the asymptote associated with current productivity, until habitat conditions improve." The commenter believes that the EDT model has received very critical reviews from the Salmon Recovery Science Review Panel and from the Columbia Basin Independent Science Advisory Panel.

Response: Calculating a rebuilding exploitation rate ideally requires knowledge of a spawner-recruit relationship based on escapement, age composition, coded-wire tag distribution, environmental parameters, and management error. These types of data are available for several management units (Table 8 of the PEPD). For populations with insufficient data to develop a spawner-recruit relationship, generic guidance from the VSP paper or, when available, analyses of habitat capacity (such as the EDT methodology) have been used to assist NMFS in evaluating the RMP's proposed thresholds. NMFS uses the best scientific data available in this evaluation. Habitat capacity is difficult to measure and estimation is now accomplished by several different methods. NMFS acknowledge that all models have strengths and weaknesses. NMFS has made appropriate comparisons of the models and their outputs to help evaluate the RMP's upper management thresholds.

"Low Abundance Thresholds" Comments:

Comment 20: The commenter states that the RMP defines a low abundance threshold as "a spawning escapement level, set intentionally above the point of biological instability, which triggers extraordinary fisheries conservation measures" to minimize fishery related impacts and increase spawning escapement. The commenter believes that the RMP's

claim that the low abundance thresholds are set above the point of biological instability is misleading.

Response: As required in section (b)(6)(iii) of the ESA 4(d) Rule, the RMP must adequately address eleven criteria under section (b)(4)(i) in Limit 4. The analysis of the anticipated results of implementing the RMP, not the RMP's characterization, was compared against the criteria defined under Limit 6 of the ESA 4(d) Rule (see response to Comment 5). After taking into account uncertainty, the critical threshold is defined as a point under current conditions below which: (1) depensatory processes are likely to reduce the population below replacement; (2) the population is at risk from inbreeding depression or fixation of deleterious mutations; or (3) productivity variation due to demographic stochasticity becomes a substantial source of risk (see page 15 of NMFS 2000b as cited in the PEPD). NMFS-derived critical thresholds ranged from 200 to 1,650 fish. These critical thresholds may be revised as additional information becomes available on how an individual population responds to low abundance. NMFS finds that the RMP's low abundance thresholds are generally set at or above what are considered to be critical thresholds (point of biological instability) for the chinook populations based on a survey of the literature and population-specific assessments. However, NMFS recognizes these thresholds are likely to vary over time as habitat conditions change.

Comment 21: The commenter believes that the SUS exploitation rates will generally increase when the minimum fishery regime [equating to the RMP's critical exploitation rate ceiling] is triggered. This might occur under circumstances when total abundances are low enough that escapements are projected to be below a population or management unit's low abundance threshold. This outcome is relative to the circumstance when the regime is triggered due to the total RER being exceeded even though escapements are expected to be above the low abundance threshold.

Response: For most management units, the RMP's critical exploitation rate ceiling imposes an upper limit on SUS exploitation rates when spawning escapement for a management unit is projected to fall below its low abundance threshold *or* if Canadian fisheries make it difficult or impossible to achieve the RMP's rebuilding exploitation rate. Modeling exercises by the co-managers demonstrate the potential for imposing the RMP's critical exploitation rate ceiling for several management units for the duration of the RMP (see response to Comment 6). The proposed critical exploitation rates are ceilings that are not to be exceeded. The commenter suggests the SUS exploitation rates will be increased to meet the ceiling when the RMP's critical exploitation rate ceiling is imposed. This is not NMFS' understanding of the co-managers' plans for implementing the RMP, nor was this outcome used as an assumption in how the fisheries were modeled. During modeling, if the SUS fisheries' impacts were already below the RMP's critical exploitation rate ceiling, the co-managers in modeling future fisheries did not increase the impacts of the SUS fisheries to reach this ceiling. If impacts under the implementation of the RMP are greater than expected, NMFS can withdraw the ESA 4(d) Rule determination or ask the co-managers to adjust the fisheries' impacts.

Comment 22: The biological importance of the low abundance thresholds was also of concern to the commenter. The commenter suggested that neither the RMP nor the PEPD clearly define the "point of biological instability" [critical threshold] or provide a clear quantitative explanation of how the proposed low abundance threshold levels are determined. The commenter further suggested that the PEPD does not provide any evidence that the RMP's low abundance thresholds are set far enough above putative points of biological instability to provide a precautionary and properly risk-averse margin of safety when they are crossed from above.

Response: See response to Comment 20.

Comment 23: The commenter stated that the RMP defines the point of instability as "that level of abundance (i.e., spawning escapement) that incurs substantial risk to genetic integrity, or exposes the population to depensatory mortality factors." The commenter believes that with other critical terms employed in the RMP and the PEPD, no explanation is provided or even attempted regarding what is meant by a "substantial" risk or how such a level of risk is determined.

Response: NMFS did not evaluate the RMP's definition of the point of instability. NMFS' evaluation focused on the effects of implementing the RMP's mortality limits, regardless of their basis. In the PEPD, NMFS compared the RMP's low abundance thresholds against NMFS-derived or VSP-derived critical thresholds threshold (see response to Comment 20 for NMFS' definition of a critical threshold). The co-managers' basis in the development of the RMP's low abundance thresholds was not needed to make this comparison. In the PEPD, NMFS concludes that the RMP's low abundance thresholds are generally set at or above what are defined as, or considered to be, the critical thresholds.

"Critical Exploitation Rate Ceiling" Comments:

Comment 24: The commenter expressed concern that the application of an exploitation-rate ceiling in response to crossing a critical-abundance threshold from above would be based on policy objectives rather than biological considerations.

Response: See responses to Comments 9 and 21.

Comment 25: The commenter expressed concern about an apparent disconnect between the descriptions of the Critical ER [exploitation rate] Ceilings and their apparent actual effects on impact rates. The commenter suggested that no discussion is offered in the PEPD on how a minimally acceptable level of access was determined, who determined it, or why.

Response: The RMP does include discussion on how a minimally acceptable level of access was determined. See responses to Comments 5 and 21.

Comment 26: The commenter suggested that the association of the Critical ER Ceilings with RERs and the low abundance thresholds creates the implication of a two-tiered harvest regime for each MU [management unit], with separate impact-rate schedules above and below the thresholds. However, there is little indication that the provisions of the RMP would necessarily affect any significant difference in overall impacts on an MU, no matter what level of abundance it reaches, or whether or not Critical ER Ceilings are imposed.

Response: See response to Comment 5 and 21.

"Other Issues of Concern" Comments:

Comment 27: The commenter believes that the range of variability in chinook salmon productivity is not fully considered. The commenter suggests that the PEPD uncritically accepts the likely range of abundances of adult chinook returns under the six-year RMP implementation period chosen by the co-managers for their modeling of the impacts of implementing the RMP. The commenter believes that the PEPD fails to require that the co-managers adopt more risk-averse modeling assumptions in estimating the likely impacts on listed chinook of the implementation of the RMP.

Response: As mentioned earlier, Table 3 of the PEPD provides the anticipated range of exploitation rates and anticipated escapements for Puget Sound chinook salmon under the implementation of the RMP. Two variables were used in the modeling of the future fisheries to provide these anticipated ranges of exploitation rates and anticipated escapements. These modeling variables were abundance of returning salmon and impacts associated with the level of Canadian fisheries. The modeled salmon abundance in 2003 was used to estimate the upper end of the annual abundance returns under the implementation of the RMP. A 30 percent reduction in the 2003 abundance was used to represent the lower range of modeled returns. This range of modeled abundance is similar to the variation in observed abundance for the ESU recently. However, this range is considered conservative given the increasing escapement trend in recent years. Given the general trend of stable to increasing abundance, it is likely that if the actual abundance in the next five years falls outside this range, the actual abundance would most likely be greater. Under the implementation of the RMP, it is unclear if Canadian conservation actions will continue or if impacts will increase to maximum levels allowed under the Pacific Salmon Treaty. In modeling the Canadian fisheries, the impacts similar to fisheries in 2003 were used to represent the lower range of anticipated impacts. Maximum harvest levels allowed under the Pacific Salmon Treaty were modeled to represent the upper range of impacts associated with Canadian fisheries. Fisheries can not go above this level under the terms of the Pacific Salmon Treaty. The evaluation used the modeling based on the maximum harvest levels under the Pacific Salmon Treaty as the most likely to occur within this range. Canadian impacts, under the agreement of the Pacific Salmon Treaty, may not be greater than the level assumed as the most likely to occur. The range of abundance was chosen by NMFS in consultation with the co-managers and based on an examination of abundance and survival conditions over the past ten years.

Comment 28: The commenter believes negative impacts of hatchery chinook salmon on natural-origin chinook salmon are ignored, misinterpreted, or inappropriately accepted. The commenter expressed that the Kendall Creek Hatchery is currently operating without ESA take authorization. The commenter suggests that the PEPD's assertions that the Kendall Creek hatchery population "retains the genetic characteristics of the wild population," or that hatchery production at Kendall Creek "buffers genetic and demographic risks" to wild NF [North Fork] Nooksack River chinook salmon are precisely the assertions that NMFS has yet to make any determination over.

Response: In its recent proposed revision of the Puget Sound chinook salmon ESA listing, NMFS has proposed that the Kendal Creek Hatchery population be determined to be part of the Puget Sound Chinook Salmon ESU. 69 Fed. Reg. 33102, 33129 (June 14, 2004). NMFS has proposed the Kendall Creek Hatchery chinook population conservation-directed program may provide substantial benefits to VSP parameters for the North Fork Nooksack River spring chinook salmon population (see section 6.2.1 of the Salmonid Hatchery Inventory and Effects Evaluation Report, An Evaluation of the Effects of Artificial Propagation on the Status and Likelihood of Extinction of West Coast Salmon and Steelhead Under the Federal Endangered Species Act, as posted on the NMFS, NWR's web-site at: http://www.nwr.noaa.gov/1srd/Prop_Determins/Inv_Effects_Rpt/6_PSoundChinook.pdf, as accessed on December 15, 2004). The North Fork Nooksack River spring chinook salmon population is a unique population that will likely be considered important for recovery of the Puget Sound Chinook Salmon ESU to a viable level. The program likely benefits the abundance, diversity, and spatial structure of the North Fork Nooksack River population. NMFS and the co-managers recognize that the Kendall Creek hatchery-origin fish spawning in the South Fork Nooksack River are a risk, not a benefit to the South Fork Nooksack River population. This was one of the reasons that the co-managers reduced the Kendall Creek early chinook salmon hatchery production by 50 percent in 2003 (W. Beattie, NWIFC, e-mail to K. Schultz, NMFS, August 6, 2004). However, the Kendall Creek Hatchery, and the other chinook hatchery programs in Puget Sound are currently under review by NMFS for our evaluation and determination under limit 6 of the ESA 4(d) Rule. Therefore, this finding regarding the Kendall Creek Hatchery chinook population is considered preliminary. The ERD was modified to reflect that the Puget Sound hatchery programs are being reviewed by a separate Limit 6 determination of the ESA 4(d) Rule.

Comment 29: The commenter believes that the RMP lacks clarity in describing how it recognizes "Viable" and "Critical" concepts.

Response: See response to Comment 20 for NMFS' definition of a critical threshold, which is consistent with the VSP paper for a critical threshold. The regulations in the ESA 4(d) Rule require that the RMP must use the concepts of "viable" and "critical" thresholds in a manner so that fishery management actions; (1) recognize significant differences in risk associated with viable and critical population threshold states, and (2) respond accordingly to minimize long-term risks to population persistence. The RMP

defines its own upper management and low abundance thresholds, but these are readily comparable to the NMFS-derived or VSP-derived viable and critical thresholds. The ESA 4(d) Rule also requires that harvest actions that impact populations that are currently at or above their viable thresholds must maintain the population or management unit at or above that level. Fishing-related mortality on populations above critical levels but not at viable levels (as demonstrated with a high degree of confidence) must not appreciably slow rebuilding to viable function. Fishing-related mortality to populations functioning at or below their critical thresholds must not appreciably increase genetic and demographic risks facing the population and must be designed to permit achievement of viable functions, unless the RMP demonstrates the likelihood of survival and recovery of the entire ESU in the wild would not be appreciably reduced by greater risks to an individual population. Table 9 in the PEPD is the post-listing threshold classification and escapement trend since listing for Puget Sound chinook salmon populations. In the PEPD, NMFS found the RMP was responsive to the populations' status, when compared to the critical or viable thresholds, as required by the ESA 4(d) Rule.

Comment 30: The commenter believes that there is a lack of consistency between the PEPD and RMP. The commenter received and reviewed information from WDFW regarding the co-managers' 2004 fishing plan, outlining model predictions of expected impacts and escapements for all management units. The commenter suggested that several of the exploitation-rate and escapement predictions fall well outside the range of likely impacts and escapements described in Table 3 of the PEPD.

Response: NMFS, in cooperation with the co-managers, have modeled the anticipated impacts of the implementation of the RMP. NMFS recognized that in this modeling exercise, conservative assumptions were made and that there was always the possibility that in any individual year the results could be different than the range of possibilities considered. In recent years, the post-season assessment has generally shown that estimated exploitation rates are lower than pre-season projections, with the escapement often higher than predicted pre-season (W. Beattie, NWIFC, e-mail to K. Schultz, NMFS, August 6, 2004). If impacts under the implementation of the RMP are greater than expected, NMFS can withdraw the ESA 4(d) Rule determination or ask the co-managers to adjust fisheries to reduce impacts. Generally, the 2004 pre-season modeled escapement results are within or greater than the range of predicted escapements in the PEPD. This can be, in part, attributed to the use of risk-averse modeling assumptions in modeling impacts and the resultant escapement under the RMP (see response to Comment 27).

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